EXHIBIT P

EXHIBIT 12

U.S. Patent No. 10,135,682 (the "'682 Patent") Exemplary Infringement Chart

Comcast operates and maintains a nationwide television and data network through which it sells, leases, and offers for sale products and services, including the Technicolor TC8717 cable modem, Technicolor CGM4140 cable modem, Technicolor CGM4331 cable modem, and products that operate in a similar manner ("Accused Cable Modem Products"), as well as the Arris AX013ANC STB, Arris AX013ANM STB, Arris AX014ANC STB, Arris AX014ANM STB, Arris MX011ANC STB, Arris MX011ANM STB, Pace PX013ANC STB, Pace PX013ANM STB, Pace PX022ANC STB, Pace PX022ANM STB, Samsung SX022ANC STB, Samsung SX022ANM STB, and products that operate in a similar manner ("Accused Set Top Products"). Comcast provides cable television and internet services ("Accused Services") via the lease, sale, and/or distribution of the Accused Cable Modem Products and/or the Accused Set Top Products. Comcast literally and/or under the doctrine of equivalents infringes the claims of the '682 Patent by making, using, selling, offering for sale, and/or importing the Accused Services, Accused Cable Modem Products, and/or the Accused Set Top Products.

As shown below in the chart with exemplary support, the Accused Services infringe at least claims 1-5 and 9 of U.S. Patent No. 10,135,682 ("'682 Patent"). The '682 Patent was filed January 9, 2018, issued November 20, 2018, and is titled "Method and System for Service Group Management in a Cable Network." The '682 Patent claims priority to U.S. Patent Application Serial No. 15/434,673 filed on Feb. 16, 2017; U.S. Patent Application Serial No. 15/228,703 filed on Aug. 4, 2016; U.S. Patent Application Serial No. 13/948,444 filed on Jul. 23, 2013; and U.S. Provisional Patent Application No. 61/674,742 filed on Jul. 23, 2012.

The Accused Services are provided by utilizing, for example, a Cable Modem Termination System ("CMTS") and/or Converged Cable Access Platform ("CCAP") operated by Comcast in communication with Cable Modem Products and/or Set Top Products located at each subscriber location. The Accused Services infringe the claims of the '682 Patent, as described below, either directly under 35 U.S.C. § 271(a), or indirectly under 35 U.S.C. §§ 271(b)–(c).

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1pre	A method comprising:	The Accused Services perform the claimed method utilizing, for example, including a Cable Modem Termination System ("CMTS") and/or Converged Cable Access Platform ("CCAP") operated by Comcast in communication with at least one Cable Modem Product and/or Set Top Product located at each subscriber location. The Accused Services utilize CMTSs and/or CCAPs to send and receive packets to downstream cable modems over the Internet. By way of example, the Technicolor CGM4140 cable modem is charted herein. As described below, the Technicolor CGM4140 has a Broadcom BCM3390 SoC. On informed belief, all cable modems deployed by or enabled by Comcast that contain the BCM3383, BCM3384, and BCM33843 series chips operate substantially the same as the BCM3390 series chips for purposes of the '682 Patent. As there are no functional differences between the BCM33843 SoC and BCM3390 SoC that impacts infringement of the '682 Patent, documents describing the operation of the BCM33843 SoC equally describe the operation of the BCM3390 SoC. Therefore, the Technicolor CGM4140 is representative of all Accused Set Top Products and Accused Cable Modem Products, including those having BCM3383, BCM3384, BCM33843, or BCM3390 SoCs. Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1a	determining, by a cable modem termination system (CMTS), for each cable modem served by said CMTS, a corresponding	The CMTS and/or CCAP determine, for each cable modem served by said CMTS and/or CCAP, a corresponding signal-to-noise ratio (SNR) related metric as described below.

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	signal-to-noise ratio (SNR) related metric;	The Accused Cable Modem Products, such as the Technicolor CGM4140, include chips capable of receiving and transmitting performance data to the CMTS and/or CCAP, such as Broadcom's BCM3390 system-on-a-chip ("SoC"), shown in the photograph below.  Accordingly, the Accused Set Top Products and Accused Cable Modem Products, are capable of bidirectional communications with the CMTS and/or CCAP.

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		The Accused Services use CMTSs and/or CCAPs to determine a corresponding signal-to-noise ratio (SNR) related metric for each cable modem served by said CMTS. On informed belief, the CMTS and/or CCAP utilizes a spectral analysis engine associated with an upstream receiver to gather detailed information about upstream channel noise and obtain information regarding downstream channel noise from the Accused Set Top Products and Accused Cable Modem Products. For example, the CMTS, via its PMA system, collects a variety of SNR-related metrics from both the Accused Set Top Products and Accused Cable Modem Products and the CMTS and/or CCAP, such as modulation error ratio (MER) and forward error correction (FEC) for upstream and/or downstream channels. On informed belief, MER and FEC are SNR-related metrics. "In 2019, Comcast developed a Profile Management Application (PMA) system for generating and transacting D3.1 downstream (DS) profiles tailored to the conditions of each Orthogonal Frequency Division Multiplexed (OFDM) channel in its network. The approach, machine learning algorithms and system architecture were described in a previous SCTE technical paper [1]. The initial plan for this follow-up paper was to focus on Comcast's PMA deployment journey, the success of which is evidenced by thousands of Cable Modem Termination Systems (CMTSs) managed by the PMA, yielding greater than 20 Tbps of added downstream (DS) capacity to the network." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001970) "The US is a different story. As a fraction of the total available spectrum, and even as it is being industrially widened from sub-split to high-split configurations, the fact remains that US capacity is a more difficult challenge. Commencing with shelter-at-home requirements, US traffic grew sharply, seemingly overnight. Comcast has publicly shared data on the increases in traffic scale since COVID started […], along with transparency about the level of investment and technological attention that prepared us for "Black Swan" scenarios like a pandemic. This enabled more effective management of the additional traffic growth delivered over the Data Over Cable Service Interface Specification (DOCSIS) broadband network [5]. As this paper will ultimately show, by adding an

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		upstream PMA focus to the existing PMA suite, we were able to boost upstream capacity by 36%, from 86 Mbps to 117 Mbps." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001970) "The PMA system, as described previously, was extended to implement US D3.0 PMA functionality. The capacity is increased (or decreased) in small steps, while errors are fixed proportionally or predictively, either by increasing robustness or detecting transient noise indicators." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001983) "The PMA system is composed of four separate components, shown in Figure 3: Data Collector, Data Storage, Analytics Engine, and Configuration Manager." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) "The Data Collector is responsible for collecting telemetry data from CMTSs and gateway devices. The data is polled at different frequencies that range from every 5 min to hourly, and was designed to constitute a "comprehensive poller," enabling applications beyond the scope of PMA. From a PMA perspective, the data needed to support the construction of OFDM profiles falls into the following categories: Network topology: Establishes linkage between device, OFDM channel, and CMTS. Configuration model: Provides characteristics of the OFDM channel, e.g. number of subcarriers, subcarrier width, frequency range, position of exclusion bands, etc. CMTS type: Provides make, model, hardware & software versions of a given CMTS. Telemetry: Retrieves Modulation Error Ratio (MER), Forward Error Correction (FEC), signal, and traffic measurements from devices, and channel utilization measurements from CMTSs. This category constitutes the largest bulk of the data, given that MER spectra are measured at a per-device OFDM subcarrier resolution, with 4096 data points for each MER sample for each device." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972-3)

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		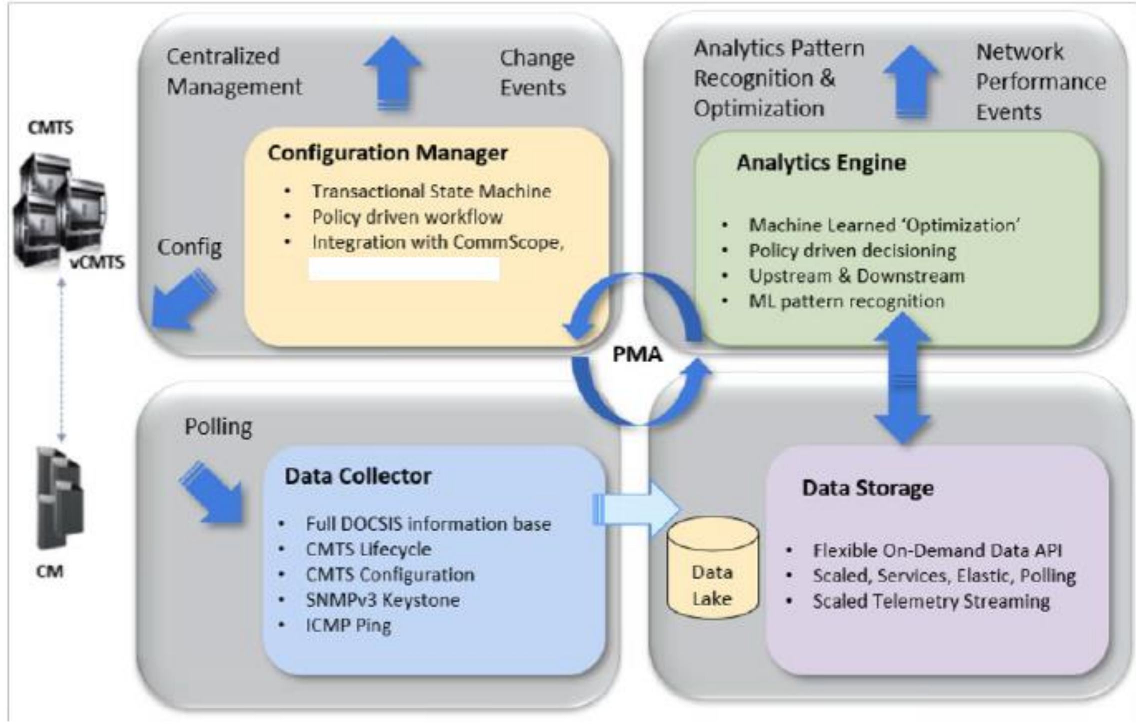 **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1b	assigning, by said CMTS, each cable modem among a plurality of service groups based on a	A service group includes one or more cable modems. The CMTS and/or CCAP assigns each cable modem among a plurality of service groups based on a respective corresponding SNR-related metric as described below.

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	respective corresponding SNR-related metric;	Specifically, the CMTS and/or CCAP profiles cable modems to determine characteristics of the communication channel between the CMTS and/or CCAP and the downstream Accused Set Top Products and Accused Cable Modem Products. On informed belief, the CMTS and/or CCAP allows a fixed number of modulation profiles to be defined. The CMTS and/or CCAP organize the downstream Accused Set Top Products and Accused Cable Modem Products into groups based on the SNR-related metric. On informed belief, this grouping is performed independently for the upstream channels and the downstream channels. All the cable modems in a particular group use a modulation profile assigned to the group. “Algorithmically, the AE uses hierarchical clustering—a type of unsupervised machine learning algorithm—to group together devices that share common noise characteristics and assign them a common modulation profile. Additional smoothing algorithms are applied post-clustering, to reshape the segments according to given constraints. In the current version of the algorithm, the clustering objective function is designed to maximize capacity around a statistical decision boundary.” (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973)

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		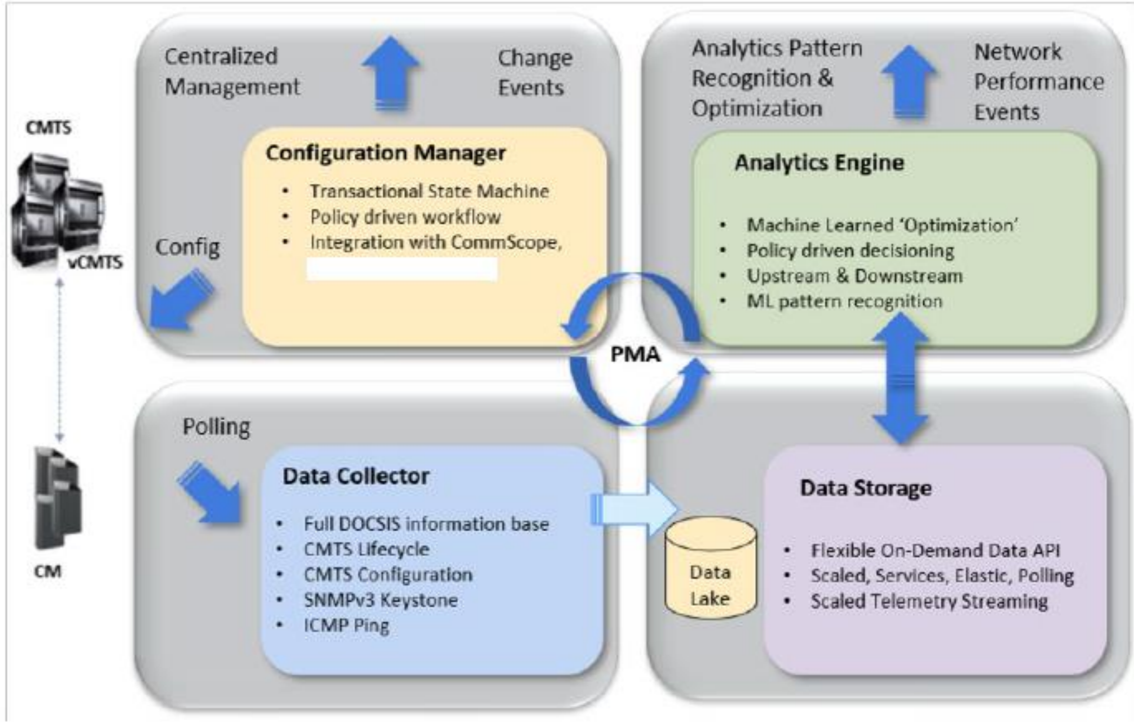 **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1c	generating, by said CMTS for each one of said plurality of service groups, a composite	The CMTS and/or CCAP generate, for each one of said plurality of service groups, a composite SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups as described below.

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	SNR-related metric based at least in part on a worst-case SNR profile of said SNR-related metrics corresponding to said one of said plurality of service groups;	Specifically, the CMTS and/or CCAP generate SNR-related metrics based on a worst-case SNR profile of each service group. For example, the CMTS and/or CCAP selects a modulation profile based on worst-case noise that is expected on the upstream channel and still achieve a reasonable level of performance for the Accused Set Top Products and Accused Cable Modem Products in each of the service groups. For example, the CMTS and/or CCAP selects a modulation profile based on worst-case noise that is expected on the downstream channel and still achieve a reasonable level of performance for the Accused Set Top Products and Accused Cable Modem Products in each of the service groups. "The Analytics Engine (AE) is a machine learning pipeline that uses the data to construct OFDM profiles suitable for use by the devices in the network—given spectral conditions measured over certain time windows. At its core, constructing profiles is a type of optimization problem in which the stated objective is to maximize channel capacity and minimize codeword error rates, subject to certain constraints. Thus, the problem contains an inherent trade-off between improving robustness and increasing network capacity, since reducing error rates is achieved by opting for lower modulation levels, at the expense of reduced channel capacity." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973) "The constraints are dictated by the CMTS hardware and software versions, as different CMTSs support different numbers of profiles per OFDM channel. Within the construct of a profile, they may also support different numbers of modulation exception zones (segments), as well as imposing additional constraints on the attributes of a segment (e.g. segment width)." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973) "Algorithmically, the AE uses hierarchical clustering—a type of unsupervised machine learning algorithm—to group together devices that share common noise characteristics and assign them a common modulation profile. Additional smoothing algorithms are applied post-clustering, to reshape the segments according to given constraints. In the current version of the algorithm, the

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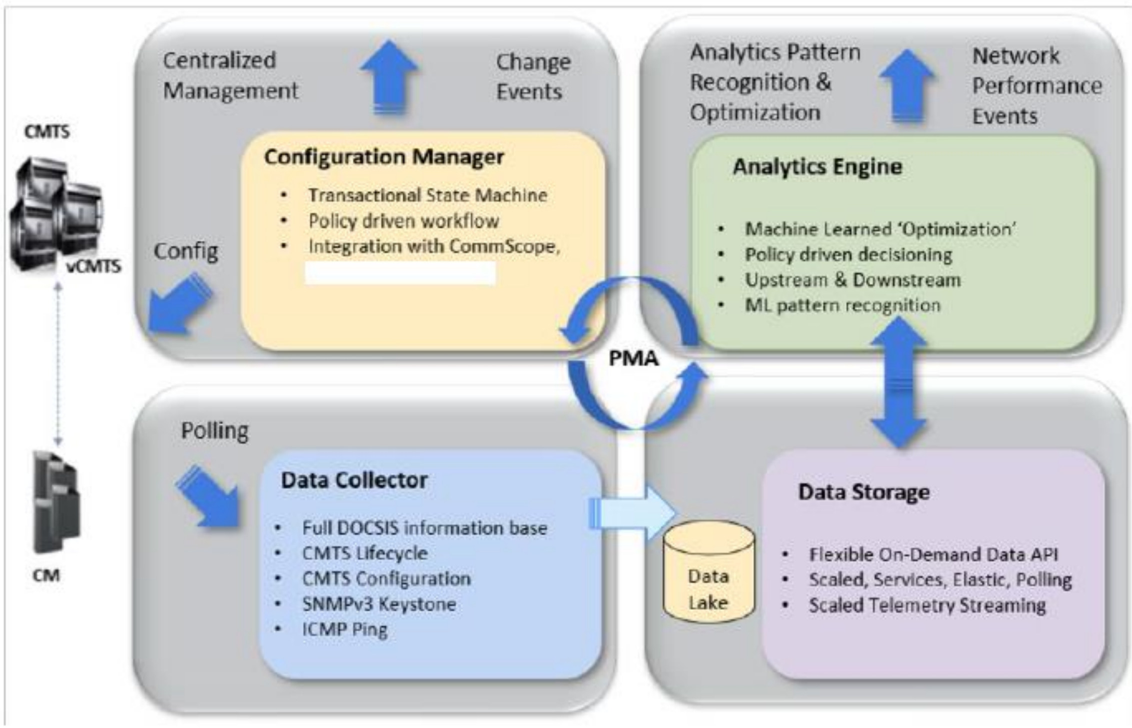
		clustering objective function is designed to maximize capacity around a statistical decision boundary.” (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973)  **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the

#	U.S. Patent No. 10,135,682	Accused Products and Services
		claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1d	selecting, by said CMTS, one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric; and	The CMTS and/or CCAP select one or more physical layer communication parameter to be used for communicating with said one of said plurality of service groups based on said composite SNR-related metric as described below. Specifically, the CMTS and/or CCAP select one or more physical layer communication parameters to be used for communicating, via a physical layer, with each service group of downstream modems. For example, the CMTS and/or CCAP select one or more physical communication parameters that control Accused Set Top Products and Accused Cable Modem Products in the various upstream channels and downstream channels, which have been configured via the modulation profiles. For example, when adding additional forward error correction to attempt to correct for errors is no longer efficient, a lower modulation rate (e.g. a physical layer communication parameter) can be applied to a particular service group. On informed belief, this adjustment of modulation rate is independently determined for upstream channels and downstream channels. "Algorithmically, the AE uses hierarchical clustering—a type of unsupervised machine learning algorithm—to group together devices that share common noise characteristics and assign them a common modulation profile. Additional smoothing algorithms are applied post-clustering, to reshape the segments according to given constraints. In the current version of the algorithm, the clustering objective function is designed to maximize capacity around a statistical decision boundary." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973) "FEC rates are considered, indirectly, by imposing additional constraints on the mapping from MER values to modulation levels (e.g. a MER value > 27 dB supports 256-QAM at maximum). As an example, the plot in Figure 4 shows MER measurements alongside the constructed profiles on

#	U.S. Patent No. 10,135,682	Accused Products and Services
		a dual y-axis plot. Since spectral conditions vary over time, multiple MER samples are captured over a time window dictated by AE policy. For each panel (device) we show 3 curves characteristic of the variation in MER: the max level (dark gray curve), the min level (light gray curve), and the 10th percentile (red curve). Also, per policy, it is the 10th percentile that is fed to the algorithm as conservatively representative of the device's MER state. The constructed profiles are overlaid on the plots and follow the scale of the right y-axis. In this specific example, the CMTS allows 4 profiles per OFDM channel, 4 segments per profile, and a segment width that is a multiple of 1 MHz. Profiles 1-3 are overlaid in yellow, blue, and green colors, respectively on the devices that are assigned to each of the 3 profiles. Profile 0 (not shown) is the control profile and is set to a flat 256-QAM by AE policy. Note that the impairments shown are generated in the lab and applied to select devices. Because of the CMTS-imposed limitation of 4 exception zones (segments), the algorithm overcompensates for the V-shaped impairment exhibited in the MER spectra of device #5." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973) "Lastly, the Configuration Manager (CM) is responsible for transacting profiles generated by the AE. The output from the AE defines profiles according to a standardized intermediate JSON format that is agnostic to the CMTS make and model. The CM converts the output to commands that are specific to the CMTS. The CM is also responsible for validating the profiles, deciding on whether to reject or accept the AE recommendations, scheduling the transacting of the profiles according to a policy that defines allowed maintenance dates/times, and performing pre- to post-transaction checks to confirm that the configuration was successfully applied." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973)

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		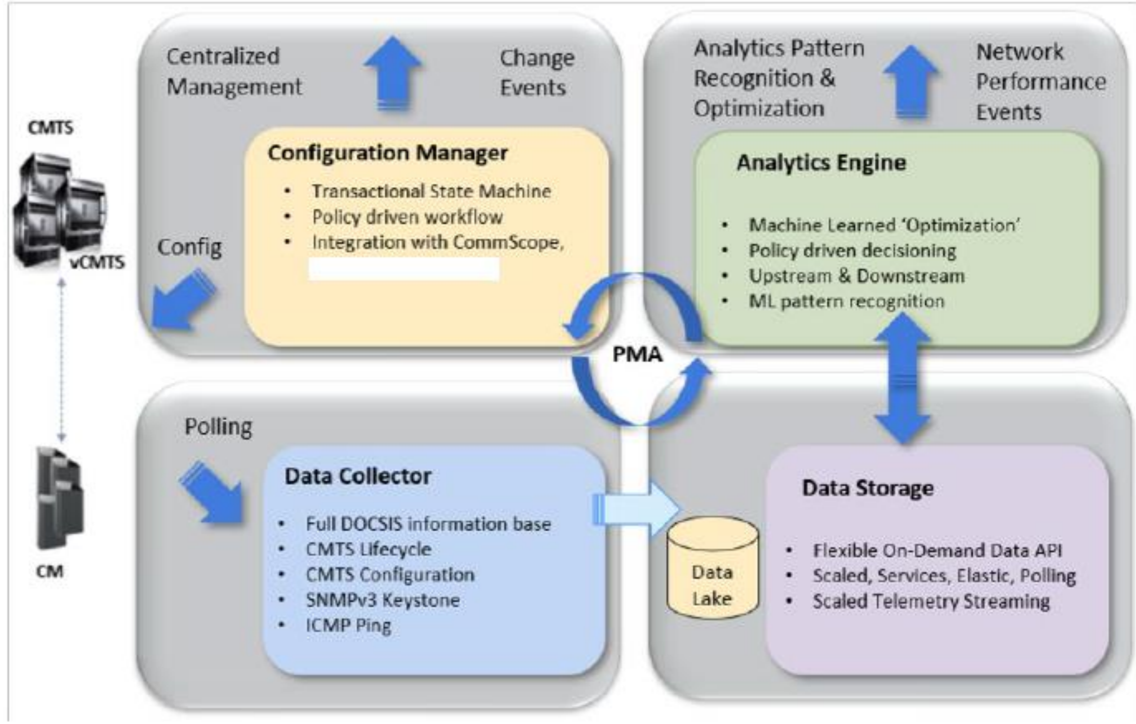 **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
1e	communicating, by said CMTS, with one or more cable modems corresponding to said one of said	The CMTS and/or CCAP communicate with one or more cable modems corresponding to said one of the plurality of service groups using the selected one or more physical layer communication parameter as described below.

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	plurality of service groups using said selected one or more physical layer communication parameter.	Specifically, the Accused Services communicate, via CMTSs and/or CCAPs, messages that include parameters that control the Accused Set Top Products and Accused Cable Modem Products in each of said plurality of service groups in the applicable upstream and downstream channels. These communications utilize the selected one or more physical layer communication parameters. "Lastly, the Configuration Manager (CM) is responsible for transacting profiles generated by the AE. The output from the AE defines profiles according to a standardized intermediate JSON format that is agnostic to the CMTS make and model. The CM converts the output to commands that are specific to the CMTS. The CM is also responsible for validating the profiles, deciding on whether to reject or accept the AE recommendations, scheduling the transacting of the profiles according to a policy that defines allowed maintenance dates/times, and performing pre- to post-transaction checks to confirm that the configuration was successfully applied." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973)

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		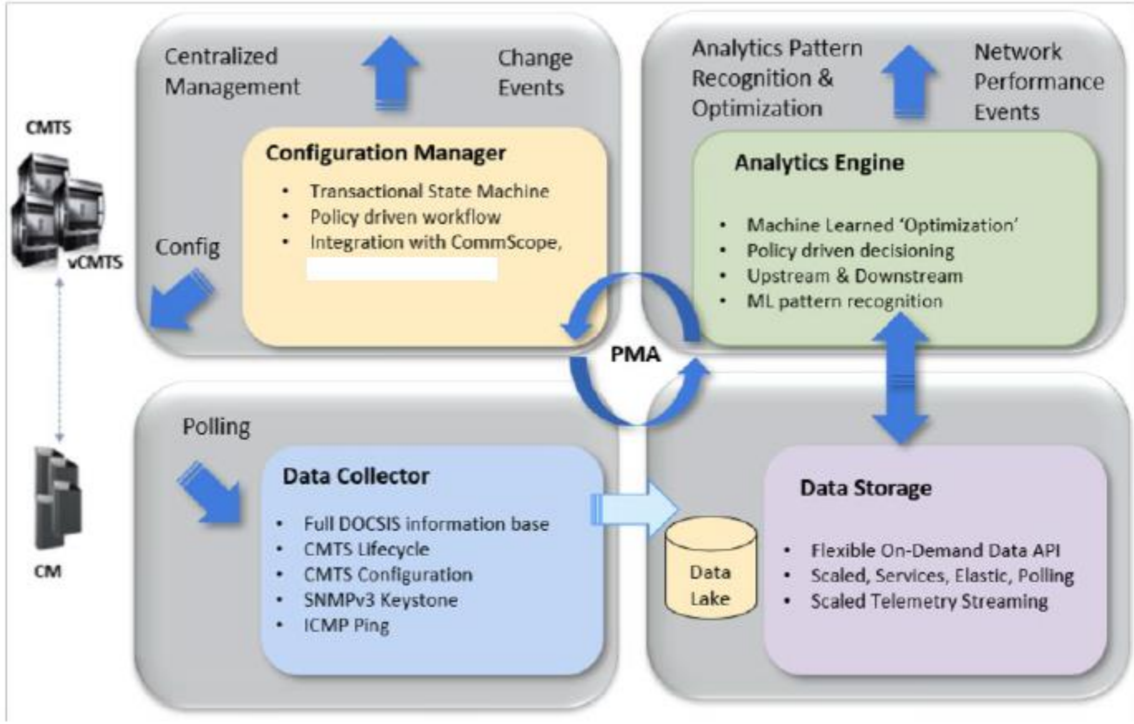 **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.

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2	2. The method of claim 1, wherein said one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate.	Said one or more physical layer communication parameter includes one or more of: transmit power, receive sensitivity, timeslot duration, modulation type, modulation order, forward error correction (FEC) type, and FEC code rate as described below. More specifically, a modulation profile includes at least a modulation type and a modulation order. "The modulation profile capacities shown in the Figure 11 are based on compatible upstream channel configurations and channel widths. Similar templates exist for the narrower 3.2 MHz and 1.6 MHz channels. Figure 11 summarizes a subset of modulation profile attributes that must be set compatibly with the US channel attributes and other aspects, such as codeword size, preamble length, guard time, and interleaver settings. For example: profile 251 uses a 97 bytes payload and a 2 bytes parity for the short data grant, a 247 bytes payload and a 4 bytes parity for the long data grant, and designates the cutoff between short and long data grants to be 5 minislots in length (the burst size). The station maintenance and unsolicited grant service interval usage code (UGS IUCs) are similarly optimized to achieve the efficient use of minislots and required robustness. Each template consists of 25 profiles, constructed to comprehensively sample the parameter space, along the modulation and FEC regime dimensions. For example, profile 251 exhibits the highest modulation (256-QAM) and least robust profile (meaning the profile with the lowest FEC overhead.)" (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001983-4)

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Figure 11 - The profile configuration template for 6.4 MHz-wide channel.

(ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001984)

Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the

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		claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
3	3. The method of claim 1, wherein said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating.	Said CMTS uses orthogonal frequency division multiplexing (OFDM) over a plurality of subcarriers for said communicating as described below. Specifically, the CMTS and/or CCAP use OFDM to communicate with at least the Accused Cable Modem Products via downstream channels. On informed belief, the CMTS and/or CCAP use OFDMA to communicate with at least the Accused Cable Modem Products via upstream channels. Both OFDM and OFDMA utilize a plurality of subcarriers for communications between the CMTS and/or CCAP and at least the Accused Cable Modem Products. "In 2019, Comcast developed a Profile Management Application (PMA) system for generating and transacting D3.1 downstream (DS) profiles tailored to the conditions of each Orthogonal Frequency Division Multiplexed (OFDM) channel in its network. The approach, machine learning algorithms and system architecture were described in a previous SCTE technical paper [1]. The initial plan for this follow-up paper was to focus on Comcast's PMA deployment journey, the success of which is evidenced by thousands of Cable Modem Termination Systems (CMTSs) managed by the PMA, yielding greater than 20 Tbps of added downstream (DS) capacity to the network." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001970) "One methodology that shows promise in this realm is reinforcement learning (RL). In RL, the ML agent "learns" an optimal policy by interacting with the environment. The outcome is akin to allowing the agent to dynamically modify the MER mapping thresholds, or other policy attributes, per OFDM channel-profile-exception zone (segment) and based on feedback in the form of the FEC error rates encountered by devices. We are currently in the midst building a RL solution for US PMA. As will be shown in Section 4, US PMA has a limited action space, compared to DS PMA, and therefore it offers an opportunity to experiment with and refine the solution with the

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		expectation that these methods will be subsequently adapted to be used for DS PMA and D3.1 US OFDMA PMA." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001980) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
4	4. The method of claim 3, comprising selecting, by said CMTS, said one or more physical layer communication parameter on a per-OFDM-subcarrier basis.	The CMTS and/or CCAP select said one or more physical layer communication parameter on a per-OFDM-subcarrier basis as described below. Specifically, the CMTS and/or CCAP are operable to at least determine modulation profiles (e.g. physical layer communication parameters) on a per-subcarrier basis. "To leverage the new OFDM/A physical layer to its maximum benefit, different subcarriers use different modulation orders. Optimizing the downstream/upstream profiles allows a downstream/upstream channel to be able to operate with lower Signal-to-Noise Ratio (SNR) margin, potentially allowing a channel to operate at an overall higher throughput. The logic to achieve this can be external to a CCAP and enable innovation. For a cable operator, it allows uniform operation of such algorithms across different CCAP platforms." (ENTROPIC_COMCAST_001928 at ENTROPIC_COMCAST_001933) "A modulation profile is a list of modulation orders or bit loading configurations, defined for each subcarrier within an OFDM channel, or for each minislot in an OFDMA channel. A CMTS can define multiple modulation profiles/IUCs for use on a channel, where the profiles differ in the modulation orders assigned to each subcarrier or minislot. A CMTS can assign different downstream and upstream modulation profiles for different groups of CMs."

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		(ENTROPIC_COMCAST_001928 at ENTROPIC_COMCAST_001953) “PMA Goal: The goal of designing profiles is to increase reliable operation and throughput per CM. PMA essentially consists of intelligent clustering algorithms to group CMs which share similar noise characteristics together: Groups of CMs get assigned a unique custom designed profile, which works around specific ingress issues etc. The tasks an external PMA performs for both downstream and upstream profiles are as follows: 1. Create a set of optimized modulation profiles for use on an OFDM or OFDMA channel by selecting the best modulation order for each subcarrier based on the channel quality measured at the CMs/CMTS using the channel profile test or probes. (For all CMs) 2. For a new CM joining the network and periodically for all active CMs, find the best fit among existing modulation profiles and recommend modulation profile usage. (Per CM) 3. Create backup profiles or downgrade a CM based on errors on a certain profile. E.g. based on CM performance and SNR margin, provide a better modulation profile for a CM. (Per CM)” (ENTROPIC_COMCAST_001928 at ENTROPIC_COMCAST_001953) “FEC rates are considered, indirectly, by imposing additional constraints on the mapping from MER values to modulation levels (e.g. a MER value > 27 dB supports 256-QAM at maximum). As an example, the plot in Figure 4 shows MER measurements alongside the constructed profiles on a dual y-axis plot. Since spectral conditions vary over time, multiple MER samples are captured over a time window dictated by AE policy. For each panel (device) we show 3 curves characteristic of the variation in MER: the max level (dark gray curve), the min level (light gray curve), and the 10th percentile (red curve). Also, per policy, it is the 10th percentile that is fed to the algorithm as conservatively representative of the device’s MER state. The constructed profiles are overlaid on the plots and follow the scale of the right y-axis. In this specific example, the CMTS allows 4 profiles per OFDM channel, 4 segments per profile, and a segment width that is a multiple of 1 MHz. Profiles 1-3 are overlaid in yellow, blue, and green colors, respectively on the devices that are assigned to each of the 3 profiles. Profile 0 (not shown) is the control profile and is set to a flat 256-QAM by AE policy. Note that the impairments shown are generated in the lab and applied to

#	U.S. Patent No. 10,135,682	Accused Products and Services
		select devices. Because of the CMTS-imposed limitation of 4 exception zones (segments), the algorithm overcompensates for the V-shaped impairment exhibited in the MER spectra of device #5." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001973) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
5	5. The method of claim 4, wherein said one or more physical layer communication parameter includes one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS.	Said one or more physical layer communication parameter includes one or both of: which of said OFDM subcarriers to use for transmission to said CMTS, and which of said OFDM subcarriers to use for reception of information from said CMTS as described below. Specifically and on informed belief, a CMTS and/or CCAP can utilize OFDM subcarriers to communicate with at least the Accused Cable Modem Products over downstream channels (e.g. receipt from the CMTS and/or CCAP), and OFDM subcarriers in an OFDMA mini-slot to communicate with at least the Accused Cable Modem Products over upstream channels (e.g. transmissions to the CMTS and/or CCAP). "A modulation profile is a list of modulation orders or bit loading configurations, defined for each subcarrier within an OFDM channel, or for each minislot in an OFDMA channel. A CMTS can define multiple modulation profiles/IUCs for use on a channel, where the profiles differ in the modulation orders assigned to each subcarrier or minislot. A CMTS can assign different downstream and upstream modulation profiles for different groups of CMs." (ENTROPIC_COMCAST_001928 at ENTROPIC_COMCAST_001953)

#	U.S. Patent No. 10,135,682	Accused Products and Services
		Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
9pre	9. The method of claim 1, wherein said determining said plurality of SNR-related metrics comprises:	See 1pre-1a.
9a	transmitting a probe message to each cable modem, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS; and	Determining said plurality of SNR-related metrics includes transmitting a probe message to each cable modem, said probe message comprising instructions for measuring a metric and reporting said measured metric back to said CMTS as described below. More specifically, the CMTS and/or CCAP transmit a request for data, such as MER data, to each Accused Cable Modem Products and/or Accused Set Top Products. On informed belief, the request includes instructions to report the measured metrics back to the CMTS and/or CCAP. "The Data Collector is responsible for collecting telemetry data from CMTSs and gateway devices. The data is polled at different frequencies that range from every 5 min to hourly, and was designed to constitute a "comprehensive poller," enabling applications beyond the scope of PMA. From a PMA perspective, the data needed to support the construction of OFDM profiles falls into the following categories: Network topology: Establishes linkage between device, OFDM channel, and CMTS. Configuration model: Provides characteristics of the OFDM channel, e.g. number of subcarriers, subcarrier width, frequency range, position of exclusion bands, etc. CMTS type: Provides make, model, hardware & software versions of a given CMTS. Telemetry: Retrieves Modulation Error Ratio (MER), Forward Error Correction (FEC), signal, and traffic measurements from devices, and channel utilization measurements from CMTSs. This category constitutes the

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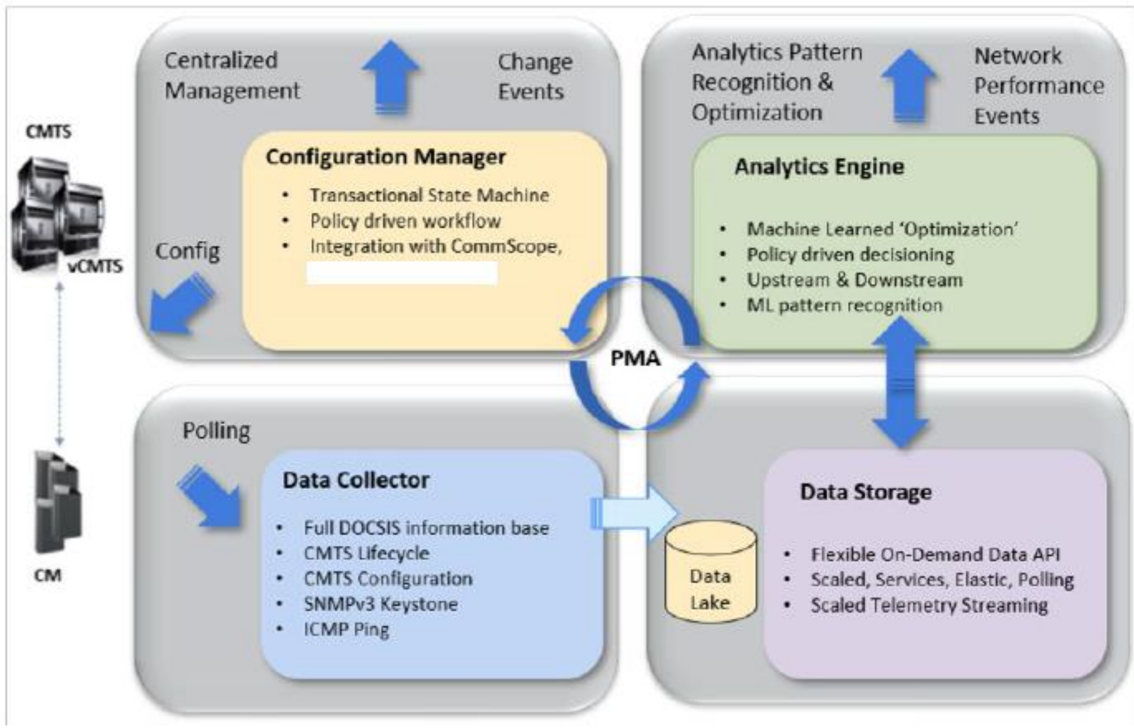
		largest bulk of the data, given that MER spectra are measured at a per-device OFDM subcarrier resolution, with 4096 data points for each MER sample for each device." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972-3)  **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the

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		claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.
9b	receiving a metric reporting message from each cable modem.	Determining said plurality of SNR-related metrics includes receiving a metric reporting message from each cable modem as described below. More specifically, the CMTS and/or CCAP receive the metric reporting message from each of the Accused Cable Modem Products and/or Accused Set Top Products. "The Data Collector is responsible for collecting telemetry data from CMTSs and gateway devices. The data is polled at different frequencies that range from every 5 min to hourly, and was designed to constitute a "comprehensive poller," enabling applications beyond the scope of PMA. From a PMA perspective, the data needed to support the construction of OFDM profiles falls into the following categories: Network topology: Establishes linkage between device, OFDM channel, and CMTS. Configuration model: Provides characteristics of the OFDM channel, e.g. number of subcarriers, subcarrier width, frequency range, position of exclusion bands, etc. CMTS type: Provides make, model, hardware & software versions of a given CMTS. Telemetry: Retrieves Modulation Error Ratio (MER), Forward Error Correction (FEC), signal, and traffic measurements from devices, and channel utilization measurements from CMTSs. This category constitutes the largest bulk of the data, given that MER spectra are measured at a per-device OFDM subcarrier resolution, with 4096 data points for each MER sample for each device." (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972-3)

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		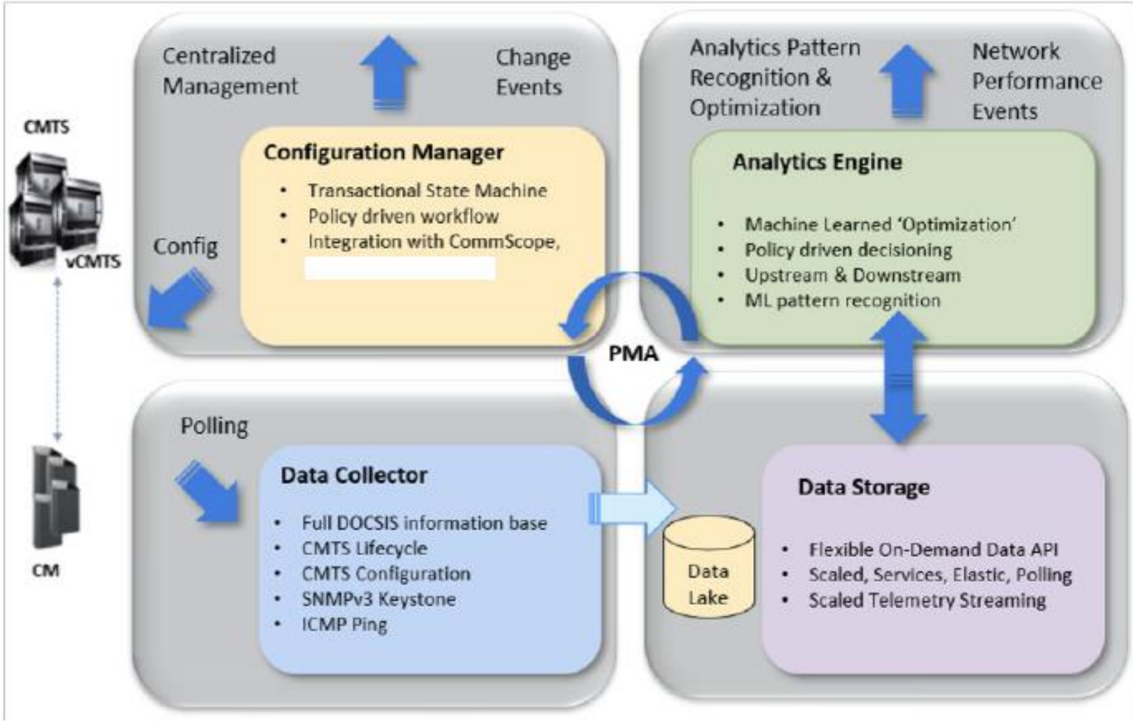 **Figure 3. The PMA System Architecture.** (ENTROPIC_COMCAST_001968 at ENTROPIC_COMCAST_001972) Discovery will provide detailed information regarding implementation and identification of the specific components, source code, software and/or other instrumentalities used to implement the claimed system. As additional information is obtained through discovery related to the Accused Services and related instrumentalities, Entropic will supplement these contentions.